DOCUMENT RESUME

ED 259 527 EC 180 263

AUTHOR Wehman, Paul, Ed.; Hill, Janet W., Ed.
TITLE Behavioral Training Strategies.
INSTITUTION Virginia Commonwealth Univ., Richmond. Rehabilitation Research and Training Center.
PUB DATE 85
NOTE 76p.; Section IV of Competitive Employment for Persons with Mental Retardation: From Research to Practice. Volume I (EC 180 259). Print is light.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS Adults; *Behavioral Science Research; *Behavior Change; Behavior Modification; Daily Living Skills; Interpersonal Competence; Job Skills; *Mental Retardation; Self Evaluation (Individuals); Simulation; Vocational Adjustment; Young Adults

ABSTRACT

Four papers address issues related to behavioral training approaches to help mentally retarded persons secure competitive employment. In the first, a combination of role-playing, modeling, and response feedback was systematically applied to accelerate appropriate responses of a 33-year old moderately retarded male to criticism, humor, and assistance seeking. In the second paper, a simulation training program was used to teach bank depositing skills to a moderately retarded (Down's Syndrome) adult. In the third paper, a reinforcement point system was used to increase appropriate job completion of a mentally retarded young adult in a natural community job setting. The final study describes how self-recording dramatically reduced the frequency and duration of early check-outs from work by a severely disabled mildly retarded adult worker. (CL)]

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)
☐ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

ED259527

BEST COPY AVAILABLE

Behavioral Training Strategies

Paul Wehman, Ed.

Janet W. Hill, Ed.

Section IV of Competitive Employment for Persons with Mental Retardation: From Research to Practice, Paul Wehman and Janet Hill, Editors. Rehabilitation Research and Training Center, Virginia Commonwealth University, Richmond, VA. 1985

DEVELOPING APPROPRIATE SOCIAL-INTERPERSONAL SKILLS IN A MENTALLY RETARDED WORKER

Michael S. Shafer Valerie Brooke Paul Wehman

Rehabilitation Research and Training Center
School of Education
Virginia Commonwealth University
Richmond, Va. 23284-0001

The development and dissemination of this paper was partially supported by grant No. GOC8301124 from the National Institute of Handicapped Research, U. S. Dept. of Education.

Abstract

The development of appropriate social-vocational skills has been identified as a critical variable affecting the long-term competitive employment of mentally retarded workers. This study investigated a training procedure for improving three classes of social behavior in a moderately retarded individual working as a custodian in a large shopping mall. A combination of role-play, modeling and response feedback was systematically applied to accelerate appropriate responses to criticism, humor and seeking assistance. Target behavior selection, response evaluation, and generalization assessments were conducted with the aid of the subject's supervisor. Implications for future social-vocational training programs and role-play assessment are discussed.

Research on the competitive employment of mentally retarded persons has focused primarily upon the acquisition of job-specific behaviors such as task sequencing or increasing productivity (Connis, 1979; Cuvo, Leaf & Borakove, 1978; Rusch, 1979; White & Kennedy, 1980). Collectively, these efforts have demonstrated that socially significant job skills can be acquired by mentally retarded persons and once acquired, facilitate nonsheltered, gainful employment.

The advancement of the mentally retarded worker into competitive employment however, requires programming efforts in other domains as well. As Rusch (1979) and Wehman (1981) discuss, the competitive worker must also exhibit proficiency in a wide array of other domains, collectively identified as social-vocational survival skills. The ability to interact with and get along with one's employer and coworkers seems to be a particularly important skill for the mentally retarded employee to acquire. Evidence has recently identified issues of social incompetence to be the primary cause for job loss among this population (Greenspan & Schoultz, 1980). As such, it appears imperative that effective job training programs for mentally retarded persons provide training to develop effective social-interpersonal skills.

Research on the development of social competence among the mentally retarded in job settings has typically assessed the reduction of socially inappropriate behavior such as noncompliance (Rusch & Menchetti, 1981), topic repetition (Rusch, Weithers, Menchetti & Schutz, 1980), or verbal abuse (Schutz, Rusch & Lamson, 1979). To date, however, a paucity of studies have occured in which socially appropriate behavior has been the target of intervention (cf., Stanford & Wehman, 1980). Given the nature and demands of nonsheltered employment, particular types of social responding appear more important than others. The ability to handle negative performance feedback (i.e., criticism) appears to be one which the mentally retarded worker may encounter quite frequently (particularly during early

employment) and which he/she may have had little or no exposure to in sheltered settings.

The amelioration of social behavior deficits among mentally retarded persons in environments other than work has typically resulted from the application of "package" interventions in which individual treatment components have not been assessed (Bangs, 1977; Bates, 1980; Perry & Cerreto, 1977; Zisfein & Rosen, 1979). Although component analysis have been lacking from these studies, a number of techniques have emerged as quite effective when applied with this population. Role-play and modeling, in particular, have been extensively used with this and other populations as a means for developing a wide array of socially appropriate behaviors. Bates (1980), for example, utilized a combination of role-play, modeling, verbal instruction and monetary reward to teach social skills to a group of eight mildly and moderately retarded subjects. Target skills consisted of handling criticism, engaging in small talk, asking for help and differing with others. Skill acquisition was evaluated utilizing a role-play assessment as well as conducting "naturalistic" probes in a community setting. Results indicated that the use of role-play assessments provided a reliable indicator of response acquisition and generalization.

The program characteristics of Bates' (1980) study provide an exemplary model for use with competitively employed individuals in need of social skill training. First, all situation role-play assessments were developed according to Goldfried and D'Zurilla's (1969) 3-step behavior analytic method of assessing social competence. This system consists of (1) situational analysis, (2) response enumeration, and (3) response evaluation. At each step, significant others in the subject's environment (eg, employers or coworkers) provide input, thereby assuring the content validity of the program. Second, the use of a role-play training strategy minimizes concerns of reactivity, denormalization or stigmatization (cf.,

Hill & Wehman, 1980; Wehman, 1981) since training sessions need not be conducted on the job site, in the presence of coworkers or supervisors. Finally, since the rating system was developed by consulting with significant others, the resultant indicator of response change may be considered to be socially valid, a particulary relevant issue in competitive employment research.

This study was designed to conduct a systematic replication (Sidman, 1963) of the program conducted by Bates (1980). Specifically, the application of a social skills development package which consisted of role play, modeling and response feedback was systematically applied to accelerate three classes of social behavior in a competitively employed, moderately retarded individual. Target behavior selection and response evaluation were socially validated as the subjects' employer identified minimal and maximal competencies for each skill area. Generalization was assessed to novel role play vignettes presented in the training setting as well on the job site.

Method

Subject

Brian, a 33 year old moderately retarded male was competitively employed as a janitor in a large shopping mall. Recent evaluations estimated Brian's I.Q. to be 46 (WAIS). He had obtained this position through the services of a unversity affiliated job placement and follow-up program (Wehman & Kregel, 1984; Wehman, et al., 1981). He had remained employed at this position for a period of 28 months. Previously, Brian had held two other jobs, each for approximately six months. The first position he resigned due to interpersonal difficulties with his coworkers whereas Brian was laid off from the second position due to financial cut backs. Brian's current responsibilities included cleaning restrooms, vacuuming carpets, sweeping and mopping floors and emptying trash cans. Although job proficiency remained within acceptable standards, the supervisor had indicated dissatisfaction

in Brian's ability to get along with others. At a subsequent meeting with the supervisor, three general areas were identified in which Brian was displaying marked difficulty. These areas consisted of handling criticism from the supervisor or coworkers, taking a joke or sarcastic remark from coworkers, and soliciting assistance.

Setting

All baseline probe, training, and post-training probe sessions were conducted at the job site immediately after work. Three locations, relatively isolated from coworkers or customers, were utilized for all sessions. These included a conference room within the mall administrative offices, a community resource room and a service hallway. Settings were selected according to availability since many times the conference room or community room would be in use.

Dependent Measures

The primary measure of social skills consisted of a role play assessment in which situations were presented which typified problematic situations for Brian. Following Goldfried & D'Zurilla's (1969) guidelines for a behavioral analytic assessment of social competence, significant others (eg, the supervisor) were surveyed to identify common problem situations, common responses and responses considered most appropriate. As a result of this survey, six situations were generated for each problem area, resulting in a total of 18 role play assessments. Each of these situations included a detailed description of a commonly encountered social situation, followed by the phrase "you say" to elicit a verbal response from Brian. For example, situation one from seeking assistance was: "You're out vacuuming when the belt breaks and the vacuum stops, you find Bill who is busy talking to someone, you say...".

For each problem area, a six-point content effectiveness (Bates, 1980) rating scale was developed. This scale provided quantitative values to Brian's social

responses, ranging from least appropriate responses (receiving a "0" score) to most appropriate responses (receiving a "5" score), as determined by Brian's supervisor and job coordinator. Detailed descriptions of the target behaviors and rating system are found in Table 1.

Reliability checks were conducted on 27 percent of all training and probe sessions by a second observer independently scoring the content effectiveness of Brian's responses. Reliability estimates were computed by summing the number of agreements of content effectiveness scores per catagory, dividing that figure by the total number of content effectiveness scores possible and multiplying by 100. Resulting relaibility estimates averaged 93% for sarcasm/humor, 100% for handling criticism, and 100% for seeking assistance.

Generalization Assessments. At the completion of all training, two assessments of generalization were conducted. The first consisted of presenting novel situations in the training setting. These consisted of three new situations generated for each problem area presented in a random order. The second assessment of generalization consisted of Brian's supervisor "setting up" some of the original training situations at various locations within the mall. For these assessments, the job trainer nor experimenter were present, but called the supervisor at the end of the work day to ascertain how Brian had responded. Only one assessment per problem area was presented, with no more than one per day being conducted.

Follow-Up Probes. Six months following the completion of training, two follow-up probes were conducted. These probes were identical in nature to those conducted prior to training (see Baseline, below).

General Training Procedures

Probe and training sessions, lasting approximately forty-five minutes were conducted 3 days per week. These sessions, which were videotaped for reliability

scoring, were attended by the trainer and Brian only.

Baseline. During baseline assessments, all situations for the three problem areas were presented in a random order. During these assessments, Brian was asked to respond as he normally would. Response feedback was not presented during these sessions although Brian was praised for his participation. Three baseline assessment sessions were conducted before training began.

Training. A combination of modeling and role-play training was sequentially applied to each problem area to accelerate the occurrence of appropriate social responses during the role play assessments. Training was first applied to humor, followed by criticism and seeking assistance, respectively.

Each training session began with an assessment of responding to all situations within the problem area currently under training. No feedback was provided for responses during this probe. Following this probe, the trainer would identify the problem area currently under training (eg., "Today we're going to talk about how to take a joke"). The trainer would then describe one of the training situations, appropriate responding to the situation and verbally describe the appropriate responses. Brian would then practice responding to the same situation for at least five trials while receiving prompts and feedback from the trainer. Each session was terminated when Brian engaged in all three target behaviors independently for one trial.

Training for each problem area continued until Brian's responses during the initial probe which preceeded each session averaged a content effectiveness score of four or better for two consecutive sessions. When Brian's responding to situations within a problem area had maintained at improved levels, training for that area was terminated and a series of bes, comparable to those carried out during baseline were conducted. Following these additional assessments, training was then implemented for the next problem area in a manner similar to that just

described.

Experimental Design. This investigation utilized a multiple-probe design (Horner & Baer, 1977) to demonstrate the effect of role-play training upon social responding to role-play assessments. Accordingly, probes across all three classes of social behavior were conducted prior to any training. During training, probes were discontinued on the two classes of behavior not currently being trained. At the completion of training for problem area, a series of additional probes across all three were again conducted, thereby establishing an extending baseline for each area.

Results

The results of the multiple-probe analysis of role-play training is presented in Figure 1. Mean content effectiveness scores are plotted along the axis with role-play assessment sessions plotted along the abcissa; training data are not included.

Prior to training, responding to each of the three problem areas was at or below the supervisor's minimal acceptable standard (in all cases a content effectiveness score of 2). For example, three baseline assessments for humor yielded a mean score of 1.9, six baseline assessments of criticism indicated a mean content effectiveness score of 1.4, nine assessments for seeking assistance yielded a mean baseline score of 2.

In all instances, the effect of the training package was immediate and dramatic, although training time varied from one class of responding to another. For example, 14, 12, and 4 training sessions were conducted for humor, criticism and seeking assistance, respectively. While training time did vary from one class of social responding to another, the impact of training upon responding to each class did not. Following training for humor, Brian's content effectiveness scores during the seven post-training assessment probes averaged 4.4 (range=4.5-3.75),

showing a slight downward trend but well within the range of supervisor acceptability. Similar results were obtained for criticism, as content effectivenss scores for this class averaged 3.9 (range=4.7-3.5) during 5 post-training assessment probes. Finally, 4 post-training assessment probes on seeking assistance yielded an average content effectiveness score of 4.5 (range =5-3.75).

Generalization probes to novel situations within the role-play environment indicated at least partial generalization. Derived content effectiveness scores were 4.3, 3.6, and 3.3, for humor, criticism and seeking assistance, respectively. In comparison, generalization probes conducted by the employer yielded slightly lower content effectiveness of 2, 3, and 4 for the three classes, respectively. Additionally, follow-up probes conducted six months after training had been completed, indicated response maintenance, as Brian's mean content effectiveness scores for these probes were 4.7, 3.5, and 4.2 for humor, criticism, and seeking assistance, respectively.

Discussion

The primary purpose of this investigation was to demonstrate the application of a complex social skills training program to maintain the competitive employment status of a mentally retarded adult. In as much as the subject of this study, Brian, is still competitively employed, the primary objective has been successfully attained. With regard to issues of research, the present study holds a number of important implications for future competitive employment investigations.

The incorporation of significant others into the process of program evaluation has been advocated as a means of assuring that socially valid research is carried out (Kazdin, 1977; Kazdin & Matson, 1981; Wolf, 1978). In the present study, Brian's supervisor was integrally involved in identifying the problem,

developing the evaluation scale and actually conducting generalization assessments. Whereas the former two functions are common components of effective job analyses (see Wehman, 1981 for thorough discussion), use of the supervisor to conduct naturalistic probes represents an innovative application in a work setting. To date, only a handful of studies have been reported in which employers or coworkers have been actively involved in collecting data (Rusch, 1983; Rusch, et al., 1980; White & Rusch, 1983). Given the reactive changes in the behavior of handicapped workers when observed (see Fischer, Wehman, & Young, 1980; Rusch, Menchetti, Crouch, Riva, Morgan & Agran, 1984), the collection of observational information by supervisors, coworkers, or others typically present in the job setting seems to warrent further application. In addition to reducing reactive effects, participant observers such as supervisors also reduce the follow-up costs associated with job placement and follow-up (Hill & Wehman, 1983; Shafer, in press).

A second aspect of this study which bears implications for future research is the treatment package itself. The role-play/modeling program utilized in this study represents a simplified version of the intervention developed by Bates (1980). Although major differences do exist between Bates (1980) package and the one utilized in this study, the key components of modeling and behavioral rehearsal are found in both. These elements appear particularly critical for developing such complex behavior as social responding among mentally retarded people. In particular, the presentation of highly relevant situations with an opportunity for repeated practice has been suggested to enhance the likelihood of altering the subject's actual behavior (Bates, 1980; Eisler, 1977). In this study, Brian was presented with situations identified by his employer to be problematic and was provided with opportunities to practice responding to these situations while receiving feedback. This approach was effective in facilitating

improvements in responding to the role play assessments.

The observed improvements in Brian's responding to the role play assessments were subsequently shown to generalize to novel situations and to a lesser extent, to more natural situations. Probes conducted on novel situations were comparable to the probing procedure employed by Bates (1980) who assessed generalized responding at each training session. Such a detailed analysis was not feasible in this study, due, in part, to restraints of subject availability and trainer time. With regard to the employer administered probes, the data from this study indicate that socially valid response changes may occur from role-play interventions. Given the lower response scores obtained during the employer probes, future research should be directed, as suggested by Bates (1980), to assess the psychometric validity of role play assessments.

In conclusion, this study was designed to systematically increase the appropriate social responses of a competitively employed worker to three problematic situations. The present results indicate that effective technologies for altering behavior may be applied competitive work settings, thereby maintaining the employment status of the handicapped worker in an effective and unobtrusive manner.

References

Bangs, T. W. (1977). Assertive training for non-assertive developmentally disabled adults. Unpublished doctoral dissertaion, University of Wisconsin, Madison.

Bates, P. (1980). The effectiveness of interpersonal skills training on the social skill acquisition of moderately and mildly retarded adults. Journal of Applied Behavior Analysis, 13, 237-248.

Connis, R. T. (1979). The effects of sequential pictorial cues, self-recording, and praise on the job task sequencing of retarded adults. Journal of Applied Behavior Analysis, 1979, 12, 355-361.

Cuvo, A., Leaf, R., Borakove, L. (1978). Teaching janitorial skills to the mentally retarded: Acquisition, generalization, and maintenance. Journal of Applied Behavior Analysis, 1978, 11, 345-355.

Eisler, R. M. (1977). Behavioral assessment of social skills. In M. Hersen & A. Bellack (Eds.), Behavioral assessment. New York: Pergamon Press.

Fischer, J. J., Wehman, P., & Young, R. (1980). Reactivity and its effect on performance of severely handicapped food service trainers. In P. Wehman & M. Hill (Eds.), Vocational training and placement of severely disabled persons: Volume 2. Richmond, VA: Virginia Commonwealth University.

Goldfried, M. R., & D'Zurilla, T. J. (1969). A behavior-analytic model for assessing competence. In C. D. Spielberger (Ed.), Current topics in clinical and community psychology, (Vol. 1): New York: Academic Press.

Greenspan, S. & Shoultz, B. (1981). Why mentally retarded adults lose their jobs: Social competence as a factor in work adjustment. Applied Research in Mental Retardation, 2, 23-38.

Hill, M., & Wehman, P. (1980). Employers and nonhandicapped coworker perceptions of moderately and severely retarded workers. Journal of Contemporary Business, 8(4), 107-112.

Hill, M., & Wehman, P. (1983). Cost benefit analysis of placing moderately and severely handicapped individuals into competitive employment. The Journal of the Association for the Severely Handicapped, 8, 30-38.

Horner, R. D., & Baer, D. M. (1978). Multiple-probe technique: A variation of the multiple baseline. Journal of Applied Behavior Analysis, 11, 189-196.

Kazdin, A. E. (1977). Assessing the clinical or applied importance of behavior change through social validation. Behavior Modification, 2, 39-54.

Kazdin, A. E., & Matson, J. L. (1981). Social validation in mental retardation. Applied Research in Mental Retardation, 2, 39-53.

Perry, M. A. & Cerreto, M. C. (1977). Structured learning training of social skills. Mental Retardation, 15, 31-34.

Rusch, F. R. (1979,a). A functional analysis of the relationship between attending and producing in a vocational training program. Journal of Special Education, 1979, 13, 399-411.

Rusch, F. R. (1979,b). Toward the validation of social/vocational survival skills. Mental Retardation, 1979, 17, 143-144.

Rusch, F. R. (1983). Competitive vocational training. In Martha E. Snell (Ed.). Systematic instruction of the moderately and severely handicapped, (2nd Edition). Columbus, OH.: Charles E. Merril Publishing Co.

Rusch, F. R. & Menchetti, B. M. (1981). Increasing compliant work behaviors in a non-sheltered setting. Mental Retardation, 19, 107-112.

Rusch, F. R., Menchetti, B. M., Crouch, K., Riva, M., Morgan, T. K., & Agran, M. (1984). Competitive Employment: Assessing employee reactivity to naturalistic observation. Applied Research in Mental Retardation, in press.

Rusch, F. R., Weithers, J. A., Menchetti, B. M., & Schutz, R. P. Social validation of a program to reduce topic repetition in a non-sheltered setting. Education and Treatment of the Mentally Retarded, 1980, 15, 208-215.

Schutz, R. P., Rusch, F. R., & Lamson, D. R. Evaluation of an employer's procedure to eliminate unacceptable behavior on the job. Community Services Forum, 1979, 1, 5-6.

Shafer, M. S. (in press). Providing follow-up services after placement: The utilization of coworkers. In F. R. Rusch (Ed.), Competitive employment: Service delivery, models, methods, and issues. Baltimore: Brookes Publishers, in press.

Sidman, M. (1963). Tactics of scientific research. New York: Basic Books, Inc.

Stanford, K., & Wehman, P. (1980). Improving the social interactions between moderately retarded and nonretarded coworkers: A pilot study. In P. Wehman & M. Hill (Eds.), Vocational training and placement of severely disabled persons, Volume 3. Richmond, Va: Virginia Commonwealth University.

Wehman, P. (1981). Training for competitive employment. In P. Wehman (Ed.), Competitive employment: New horizons for severely disabled individuals, pp. 63-75, Baltimore: Paul Brookes.

White, A., & Kennedy, K. (1980). Improving the work productivity of a mentally retarded woman in a city restaurant. In P. Wehman & M. Hill (Eds.), Vocational training and placement of severely disabled persons, Volume 2. Richmond, Va: Virginia Commonwealth University.

White, D. M., & Rusch, F. R. (1983). Social validation in competitive employment: Evaluating work performance. Applied Research in Mental Retardation, 4, 343-354.

Wolf, M. M. (1978). Social validity: The case for subjective measurement or how applied behavior analysis is finding its heart. Journal of Applied Behavior Analysis, 11, 203-214.

Zisfein, L., & Rosen, M. (1974). Effects of a personal adjustment training group counseling program. Mental Retardation, 12, 50-53.

Table 1

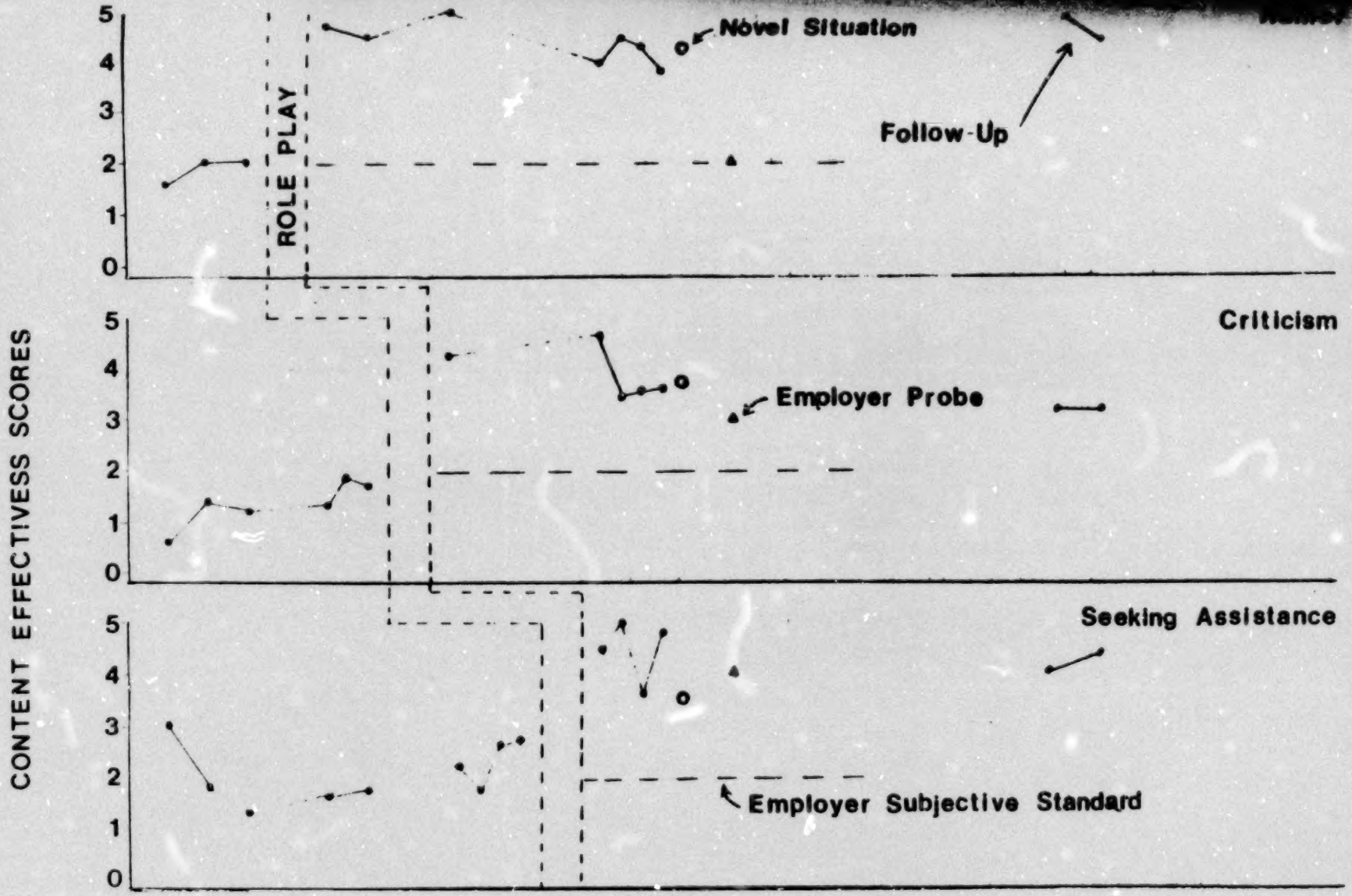
RESPONSE SPECIFICATION AND CONTENT EFFECTIVENESS SCORES

PROBLEM AREA	TARGET BEHAVIORS	EXAMPLE	CONTENT EFFECTIVENESS SCORE
Sarcasm/Humor	Verifies statement was humorous, provides humorous retort and makes truth/correcting statement	"Are you kidding? Your face looks like a bad excuse for living, actually, I like this hair cut".	5
	Verifies statement was humorous, makes truth/correcting statement	"You're joking, right?", I like these shocs"	4
	Humorous retort with truth correcting statement or verification of humor	_____	3
	Verification of humor, or humorous retort, or truth/correcting statement	_____	2
	Says nothing or says something irrelevant	_____	1
	Antagonistic comment	_____	0
Handling Criticism	Apologizes, provides excuse for performance and makes promise for improvement	"Gee Bill, I'm sorry but that stuff is real tough to get off, I'll do a better job this time".	5
	Apologizes, makes promise for improvement	"Gee, I'm sorry about that, I'll pay more attention next time you're waxing".	4
	Apologizes, provides excuse	"Sorry about that, this stuff is real hard to get off".	3
	Apologize alone or promise for improvement	_____	2
	Excuse alone or irrelevant comment	_____	1
	Antagonistic comment	_____	0
Seeking Assistance	Gets the persons attentions, makes request for assistance in question form, specifying nature of request	"Excuse me Bill, can you tell me where the mopheads are?"	5
	Same as above, but not in question form	"Pardon me, I don't know how to oil the hinges"	4
	Makes request for assistance with or without question	"How do you get this gum up?"	3
	General request for assistance without specification	"I need help".	2
	Irrelevant comment, says nothing	_____	1
	Antagonistic comment	_____	0

BEST COPY A

Figure Caption

Figure 1. Mean content effectiveness scores during role play assessments.


CONTENT EFFECTIVESS SCORES
5
4
3
2
1
0
ROLE PLAY
Novel Situation
Follow-Up
Criticism
Employer Probe
Seeking Assistance
Employer Subjective Standard

AUTOMATED BANKING SERVICES FOR MENTALLY RETARDED PERSONS

A PILOT STUDY

Michael S. Shafer Katherine J. Inge Janet W. Hill

Rehabilitation Research and Training Center
School of Education
Virginia Commonwealth University
Richmond, Va. 23284-0001

The development and dissemination of this paper was partially supported by grant No. G008301124 and contract No. 82-37-300-0357 from the U. S. Department of Education.

Abstract

This study evaluated a simulation training program to teach bank depositing skills to a moderately mentally retarded person. Based on a task analysis of specific skills, the subject was instructed to operate an automated banking machine. The skills of accessing the machine, conducting the transaction, and terminating the transaction were sequentially taught using a simulated mock-up of the automated bankmachine. Generalization probes in the natural environment were conducted before, during, and after training. Results of a multiple-probe design across target behaviors indicated that up to six months after training, the subject maintained appropriate banking skills using an actual automated banking machine. These findings further support the utility of carefully designed simulated training programs to teach community survival skills to mentally retarded persons.

Competitive employment for individuals who are mentally retarded represents a significant departure from the typical experiences and expectations of this population. Such individuals are now exposed to social settings with a majority of nonhandicapped persons, expected to perform complex vocational tasks independently, and required to engage in a host of behaviors which indirectly facilitate long-term employment (eg., maintain a neat appearance, punctually arrive at work, etc.).

In addition to the increased vocational demands placed upon the mentally retarded worker, competitive employment also represents new demands outside of the work setting. Money management, for example, takes on new meaning with competitive employment. Individuals placed into full-time competitive employment are exposed to annual salaries in excess of $7,500. In contrast, individuals employed in sheltered workshops typically earn no more than $400 annually (Whitehead, 1979). Given this gross discrepancy in earning power, it appears imperative that money management training be incorporated into the curricula of job placement and transitional vocational programs. Failure to do so continues to perpetuate the dependency of mentally retarded individuals on society which placement into competitive employment is designed to alleviate.

To date, researchers have focused their attention upon training programs designed to teach such skills as: coin equivalency (Trace, Cuvo, & Criswell, 1977), coin summation (Borakove & Cuvo, 1976; Lowe & Cuvo, 1976) and change computation (Cuvo, Veitch, Trace and Konke, 1978). Typically these skills have been taught in isolation, that is, not within the context of a community setting with little or no reference to the natural environment. The ability to engage in skills such as these greatly enhances an individual's ability to independently use various community based services. For example, riding public transportation, eating in restaurants and making minor purchases are all greatly facilitated with

the acquisition of these skills.

In addition to the use of coins, money management also encompasses the use of paper money, the use of commercial banking services, and the ability to maintain a financial budget. Unfortunately, little effort has been directed toward the development of these more complex skills. The purpose of this study was to develop and evaluate a training procedure to teach banking skills to a mentally retarded subject. Specifically, the utilization of automated banking services to make deposits into a personal account was evaluated.

The utilization of automated banking services appear to be a superior alternative to traditional banking services for a variety of reasons. First, language and/or social skills are not required to operate these machines making them ideal for use by the behaviorally deficient client. Secondly, in contrast to banking conducted with a teller, automated banking machines consistently require the same responses to be performed in the same order. As a result, skill performance on one machine has a greater likelihood of transferring to a similar machine in a different locality. Finally, automated banking services are available twenty-four hours a day, thus increasing the likelihood of performance by individuals who are employed during typical banking hours.

Method

Subject

Allan, a twenty-five year old with a diagnosis of Down's Syndrome participated in this program. Recent evaluations had indicated his functioning level to be in the moderate range of mental retardation (Full scale I.Q. = 46, WAIS). Academically, Allan displays simple counting and addition skills, however, more complex math skills are not evidenced. Additionally, he has a sight word vocabulary of approximately 50-100 words.

Currently, Allan is competitively employed part time as a dishwasher at a

restaurant. He lives at home with his mother who strongly supports his continued independence. As such, Allan regularly prepares his own meals, travels to and from work independently, and often performs chores around the house. Prior to his participation in this program Allan's mother performed all of his needed banking transactions.

Allan was selected for participation in this study on the basis of: (1) willingness to participate, (2) parental permission for him to maintain a checking account (necessary to use the automated banking system), and (3), ability to discriminate numerals. Allan had no previous experience utilizing the automated banking system.

Setting and Apparatus

Bank. Generalization probe sessions were conducted at an automated bank machine located at a bank within walking distance of Allan's place of employment. It consisted of a 6.5 x 4.5 inch video screen for messages and instructions, ten number buttons, four "decision" buttons, a "cancel" button, and four slots. Each number button had a printed numeral, and was used for entry of a personal identification number (PIN) and for entry of deposit and/or withdrawal amounts. The four "decision" buttons which were located along the right-hand side of the video screen were used for responding to the video screen instructions. The slots were used for inserting a bankcard, entering deposit material, and retrieving withdrawals and bank receipts.- A drawing of the automated bankmachine is depicted in Figure 1.

Home. Training sessions were conducted 3-4 days per week in the living room of Allan's home. A plywood replica, constructed to approximate the automated bankmachine, was used during all training sessions. A number of adaptations were used to make the replica both inexpensive as well as portable. For example, in place of the video screen found on the bank machine, a preprinted continuous loop

paper, depicting each videoscreen message, was utilized and manually manipulated by the trainer. Additionally, in place of the decision and number buttons, adhesive backed labels, cut to the approximate size of the buttons were used. Slots for the bankcard receipt, deposit and withdrawal materials were all located in approximately the same position as found on the bankmachine.

In order to simulate the operations of the bankmachine, the trainer would manually pull materials from the back side of the replica, once they had been inserted into the correct slot by Allan. In addition, the trainer manually ejected the receipt and bankcard at the end of the transaction. Additional training materials included simulated paychecks, blank receipts and envelopes obtained from the bank, and Allan's actual bankcard.

Home training procedure. All training sessions were conducted at Allan's home and involved use of the simulated bank machine and other training material previously described. Check amounts during these sessions approximated Allan's acutal pay, but were randomly determined. Each training session, which lasted approximately 30 minutes, was comprised of a training probe, trainer modeling of the component being trained, followed by five training trials.

Training probes consisted of a single trial assessment of skill performance within the component currently being trained. Based upon this probe, subsequent training trials were focused on all steps up to, and including the first step which was not performed correctly. During these probes, Allan was given a training check and was instructed to deposit it. No additional instructions, prompts, or response specific feedback were provided. At the completion of the probe, Allan was provided with general praise.

Following the training probe, the trainer modeled and verbally described the entire skill component currently being trained. Verbal description consisted of response specific statements intended to guide performance (e.g. "The first

thing I do is put my card into the machine. I hold my card just like this, with this black strip on the bottom right here"). After modeling the entire component, the trainer would then ask Allan if he had any questions before beginning the training trials.

Each training trial was initiated by handing Allan a training check and instructing him to deposit it. Allan was then required to perform all of the steps up to, and including the step identified from the training probe as the training step. For example, if Allan had correctly performed steps 1:1-1:4 during the training probe, subsequent training trials would consist of these four steps plus step 1:5, which was the first step performed incorrectly. Upon correct performance of this step during a training trial, Allan was provided with descriptive praise (e.g., "Good job! you put the card in the right way") and the trial was terminated. Incorrect responses resulted in termination of the trial followed by descriptive feedback (e.g., "No, you put the card in the wrong way") and a remedial trial of the incorrect step. During a remedial trial, Allan was instructed to perform the step (e.g. "Put your card into the machine") and prompted if necessary using a least prompting procedure. Table 2 delineates the various prompts utilized for each step. Prompted remedial trials continued until Allan independently performed the step. Correct performance of a remedial trial resulted in descriptive praise, followed by the next training trial.

Training criterion was set at 100% correct performance of all steps within a component across two consecutive training probes. If Allan correctly performed all of the steps within a component on a training probe, the session was terminated and no additional training was provided. Upon attainment of the training criterion, a series of generalization probes, using the actual bankmachine, were conducted on subsequent separate days.

Generalization probes. Allan's behavior was observed at the automated bank

machine before, during, and after training. A probe consisted of giving Allan an actual paycheck and instructing him to deposit it. Except for initial instructions, no trainer-subject interaction occurred until Allan walked away from the machine, or the time limit for making the deposit (10 minutes) had expired. The trainer and persons serving as observers located themselves well away from the bankmachine (25-75 ft), but within viewing distance. Observers were prepared to intervene if Allan engaged in a response which could result in the paycheck being accepted by the machine, but not credited to his account. At no time, however, was this necessary. Correct responses were prompted if absolutely necessary (i.e., if failure to emit a response would preclude testing of subsequent skills in the chain). For example, if Allan failed to insert his card correctly, an observer would intervene and properly insert the card. No feedback or instruction, however, was provided.

Maintenance probes. Six months following the termination of training a series of three follow-up maintenance probes were conducted. In contrast to the generalization probes, all observations were made unobtrusively (e.g., from cars parked within viewing distance of the bankmachine) and no interaction with Allan transpired.

Reliability. Independent observations were made during training sessions and generalization probes by undergraduate student assistants. At the completion of an observation, trainer and observer records were compared on response-by-response basis. Inter-observer reliability was calculated by dividing the number of agreements plus disagreements and multiplying by 100. An agreement was scored if both observers recorded the same response as being correctly and independently performed. Utilizing this formula, inter-observer reliability estimates were calculated for: (1) occurrences of correct responses, (2) nonoccurrences of correct responses, and (3) occurrences plus nonocurrences.

Reliability checks were conducted 33% of all home training sessions and yielded mean scores of 98%, 95%, and 99% for occurrence, nonoccurence, and total reliability, respectively. Similarly, reliability checks conducted on 50% of the generalization and maintenance probes yielded scores of 98%, 92%, and 98%.

Experimental Design

The design for this study was a multiple probe design across target behaviors (Horner & Baer, 1978). Prior to training, an initial generalization probe was conducted for all three component skills. No additional probing of components 2 or 3 were conducted until training of component 1 had been completed. At such time, all three components were probed on the bank machine, followed by an additional "true baseline" probe of component 2. Due to the slight increase in correct responding for component 2 on probe session 3, an additional probe of components 1 and 2 were conducted prior to component 2 training. Upon completion of component 2 training, probes of components 1 and 2 only were conducted until generalized responding of component 2 occured. All three components were then probed prior to training component 3. Due again to an increase in responding prior to training, additional probes were conducted to assure stable response rates. Upon completion of component 3 training, a series of follow-up probes were conducted at one week intervals and again six months following training to assess response maintenance.

Results

Presented in Figure 2 are the results of the generalization probes for components 1, 2, and 3 prior to, and following simulation training. Percentage of correct independent performance is plotted along the axis with probe sessions plotted along the abscissa.

Baseline probes for components 1 and 2 indicated insufficient skill performance to complete a transaction. Performance for component 1 during the single baseline probe was 50% as Allan engaged in four of the eight steps, but did so in

an incorrect order. Specifically, Allan removed and opened his wallet (Step 2), removed his check and bankcard (Steps 3 & 5), and then approached within 2 feet of the bank machine (Step 1). None of the steps requiring interaction with the mach-machine, such as inserting the bankcard or PIN however, were performed correctly.

Three simulation training sessions were required for component 1. Allan's performance during the training probes which preceeded each session averaged 75% (range 25% - 100%). Subsequent performance during generalization probes averaged 100%, indicating that simulation training had been effective. Performance of component 2, however, remained relatively unchanged, averaging 6.5% (range 0-25%) during four baseline probe sessions as Allan performed correctly the first two steps of this component on one occassion.

Five simulation training sessions were initially conducted for component 2, with training probe performance during these sessions averaging 51% (range 0 -100%). Since performance for training sessions 4 and 5 were 100%, a generalization probe was conducted. Performance during this probe maintained at 100% for component 1 whereas component 2 performance was 12.5%. The reason for this poor performance became readily apparent as the video screen displays had been slightly altered, requiring responses to different "decision" buttons. Specifically, the selections for step 2 (identifying checking account) had all been moved up, requiring that the first, rather than the second button be pressed. Allan, however, continued to press the second button, suggesting that simulation training had identified positional cues as the relevant stimulus.

In order to assure that Allan was attending to the words displayed on the videoscreen as the relevant stimuli, additional simulation training was conducted. During these four additional training sessions, the placement of all key decision words were randomly altered such that they corresponded with different decision buttons on each trial. Transfer of stimulus control was quickly evidenced as

this poor performance became readily apparent as the video screen displays had been slightly altered, requiring responses to different "decision" buttons. Specifically, the selections for step 2 (identifying checking account) had all been moved up, requiring that the first, rather than the second button be pressed. Allan, however, continued to press the second button, suggesting that simulation training had identified positional cues as the relevant stimulus.

In order to assure that Allan was attending to the words displayed on the videoscreen as the relevant stimuli, additional simulation training was conducted. During these four additional training sessions, the placement of all key decision words were randomly altered such that they corresponded with different decision buttons on each trial. Transfer of stimulus control was quickly evidenced as Allan's performance during the four training probes ranged from 0-100% (mean=50%). Following two training probes of 100%, performance was again assessed on the automated bank machine. Performance during these three probes was initially 50% but decreased to 0%. Allan's slowness in completing his responses appeared responsible for this peformance. Specifically, 30 seconds were allowed for each response; if no response was made within the allotted time period, the video-screen display would change, asking the customer if more time was needed. Since Allan had never been trained to respond to this display his performance was zero as he engaged in a number of random responses.

Simulation training was reimplemented for component 2 to improve Allan's response speed and to teach him to request more time. During four additional simulation training sessions, Allan was verbally prompted to respond quickly. If he exceeded the 30 second response limit, the trainer inserted a message display asking if more time was needed and verbally prompted Allan to respond accordingly by pressing the "decision button" corresponding to the "yes" display.

The effect of this additional training was dramatic, as Allan's performance during training probes increased from 50% to 100% for the two final training probes.

Following additional training for component 2, performance during generalization probes increased to, and maintained at 100% for ten additional probes. Performance for component 1 remained high, ranging between 100% and 88%, as Allan intermittently failed to replace his wallet in his pocket.

Generalization performance of component 3 was initially 0 following component 2 training, but increased and maintained at 83% for three pre-training probes. Specifically, Allan inadvertently pressed the "Cancel" button on probe session ten which effected the same response of the bankmachine (e.g., terminated the transaction) as did responding to the video-screen display that no additional transactions were desired. As a result of pressing the cancel button, the receipt and bankcard were ejected from the machine, requiring Allan to simply retrieve these materials and replace them in his wallet.

In order to insure that Allan had been correctly trained to utilize the automated banking system, skill training was implemented for component 3. Allan quickly learned to exit the machine in the correct manner, requiring only 3 sessions to meet acquisition criterion. Subsequent performance during six post-training generalization probes, remained high, averaging 97% (range = 83% - 100%).

Results from the maintenance probes conducted six months following training indicated sufficient skill maintenance. Specifically, Allan was observed to engage in 83% of the steps for component 1 and 100% of components' 2 and 3 steps. With regard to component 1, Allan failed to replace his wallet in his pocket, but placed it on the counter directly in front of him.

Discussion

The purpose of this study was to evaluate a program designed to teach automated banking skills to a mentally retarded client. The results obtained indicate that: a) the simulated training procedure was effective in developing appropriate banking skills, b) these increases generalized to the natural environment, and c) skill performance maintained six months following the termination of training.

The preparation of severely handicapped students through simulated teaching strategies, as characterized by this study, has recently received a great deal of criticism (Brown, Nietupski, & Hamre-Nietupski, 1976; Brown, et al, 1977, Brown, et al, 1979). Typically this criticism has been supported along two fronts. One such criticism is that simulated teaching strategies do not allow for maximum community based participation in the least restrictive environment. Additionally, these strategies have been criticized due to their often implicit assumption that skills taught under such conditions would automatically transfer to the natural environment. One need not look far to find a wealth of studies attesting to the problems of producing generalizable and durable changes in the response patterns of severely handicapped students.

In spite of these criticisms, simulated training programs continue to permeate most training efforts for this population (Wilcox & Bellamy, 1982) and has been supported by others for a variety of reasons (Neef, Iwata, & Page, 1978; Sowers, Rusch, & Hudson, 1979). Simulated training was selected for this program for a variety of reasons. First, repeated practice on the actual bank-machine was not feasible due to its frequent use by other customers as well as the inability to repeat many of the steps. For example, depositing a paycheck can only be practiced once. Secondly, due to the inherent security systems of the

bankmachine, repeated errors as encountered during the training sessions, can often result in serious consequences. As previously mentioned, four consecutive incorrect PIN entries will result in the bankmachine terminating a transaction and keeping the customers' bank card. Finally, due to the highly visible location of the bankmachine and its proximity to Allan's place of employment, simulated training was selected to minimize the stigmatization which could result from community based training.

The results obtained in this study attests to the care which must be taken when teaching under simulated conditions. For example, twice during the training of component 2, generalization probes on the automated bankmachine indicated minimal transfer. In both instances, discrepancies between training and probe environments accounts for the lack of generalization. Initially, generalization did not occur because of altered video-screen depictions which had occurred sometime during the training of this component. The continued lack of generalization, which occurred following retraining for the altered video displays, however, was the function of an incomplete task analysis. Although all responses had been carefully scrutinized, accompanying time dimensions had not been attended to. As a result, Allan independently performed all need responses, but failed to do so within an acceptable amount of time. Following additional simulation training, which required Allan to respond within specific time parameters, generalized responding was observed on the automated bankmachine.

Following generalized responding of component 2, increases in component 3 responding was observed to occur, prior to systematic training. Methodologically, this situation weakens the experimental control of the study. As with multiple baseline designs, the multiple probe design demonstrates experimental control as changes in the dependent variable(s) occur when and only when the independent

assumption that skills taught under such conditions would automatically transfer to the natural environment. One need not look far to find a wealth of studies attesting to the problems of producing generalizable and durable changes in the response patterns of severely handicapped students.

In spite of these criticisms, simulated training programs continue to permeate most training efforts for this population (Wilcox & Bellamy, 1982) and has been supported by others for a variety of reasons (Neef, Iwata, & Page, 1978; Sowers, Rusch, & Hudson, 1979). Simulated training was selected for this program for a variety of reasons. First, repeated practice on the actual bank-machine was not feasible due to its frequent use by other customers as well as the inability to repeat many of the steps. For example, depositing a paycheck can only be practiced once. Secondly, due to the inherent security systems of the bankmachine, repeated errors as encountered during the training sessions, can often result in serious consequences. As previously mentioned, four consecutive incorrect PIN entries will result in the bankmachine terminating a transaction and keeping the customers' bank card. Finally, due to the highly visible location of the bankmachine and its proximity to Allan's place of employment, simulated training was selected to minimize the stigmatization which could result from community based training.

The results obtained in this study attests to the care which must be taken when teaching under simulated conditions. For example, twice during the training of component 2, generalization probes on the automated bankmachine indicated minimal transfer. In both instances, discrepancies between training and probe environments accounts for the lack of generalization. Initially, generalization did not occur because of altered video-screen depictions which had occurred sometime during the training of this component. The continued lack of generalization, which occurred following retraining for the altered video

displays, however, was the function of an incomplete task analysis. Although all responses had been carefully scrutinized, accompanying time dimensions had not been attended to. As a result, Allan independently performed all need responses; but failed to do so within an acceptable amount of time. Following additional simulation training, which required Allan to respond within specific time parameters, generalized responding was observed on the automated bankmachine.

Following generalized responding of component 2, increases in component 3 responding was observed to occur, prior to systematic training. Methodologically, this situation weakens the experimental control of the study. As with multiple baseline designs, the multiple probe design demonstrates experimental control as changes in the dependent variable(s) occur when and only when the independent variable (i.e. training) has been applied (Horner and Baer, 1978; Kazdin & Kopel, 1975). Changes in the dependent variable prior to training are then interpreted as the effect of either extraneous variables or the facilitative effects from the acquisition of preceeding steps.

In this investigation, the untrained increase in component 3 responding appear likely to be the result of facilitative effects from previous training. This component, in contrast to the preceeding two components, requires a minimal amount of customer initiated activity. For example, to initiate this component, the user need only make one response by indicating that no other transactions are desired. Thereafter, all responses are physically prompted by the bankmachine and consist only of removing the receipt and bankcard. In comparison, component 1 required the customer to make two initiating responses by inserting the bankcard and entering the PIN; component 2 required five such responses which consisted of identifying the type of transaction, the account to be used, the amount of the deposit, verification of the deposit amount, and insertion of the deposit material. Upon the successful completion of component 2, on probe session ten, Allan pressed the

"Cancel" button, which functioned in the same manner as indicating that no additional transactions were needed.

The results of this investigation should be treated as pilot data, in need of additional replication. Further efforts however, need to attend to the patterns encountered in this endeavor, particularly in regard to the difficulties in arranging simulated environments which maximally reflect the response and stimulus variations to be encountered in the natural environment. Additionally, future efforts need to be directed toward the development of more complex money management skills which include balancing a check book, making withdrawals, etc. As mentally retarded individuals continue to move into competitive employment and enjoy the financial ramifications of such employment, these efforts become critical to the independent and community based functioning of this population.

References

Borakove, C. S., & Cuvo, A. J. (1977). Facilitating effects of coin displacement on teaching coin summation to mentally retarded adolescents. American Journal of Mental Deficiency, 81, 350-356.

Brown, L., Branston, M. B., Hamre-Nietupski, S., Pumpian, I., Certo, N., & Gruenwald, L. (1979). A strategy for developing chronological-age-appropriate and functional curricular content for severely handicapped adolescents and young adults. Journal of Special Education, 13, 81-90.

Brown, L., Nietupski, J., & Hamre-Nietupski, S. (1976). The criterion of ultimate functioning and public school services for severely handicapped students. In L. Brown, N. Certo, & T. Crowner (Eds.), Papers and programs related to public school services for secondary-age severely handicapped students. Volume VI, Part 1. Madison WI: Madison Metropolitan School District.

Brown, L., Wilcox, B., Sontag, E., Vincent, B., Dodd, N., & Gruenwald, L. (1977). Toward the realization of the least restrictive educational environments for severely handicapped students. The American Association for the Education of the Severely and Profoundly Handicapped Review. 2,

Cuvo, A. J., Veitch, V. D., Trace, M. W., & Korke, J. L. (1978). Teaching change computation to the mentally retarded. Behavior Modification, 2, 531-548.

Horner, R. D., & Baer, D. M. (1978). Multiple-probe technique: A variation of the multiple baseline. Journal of Applied Behavior Analysis, 11, 189-196.

Kazdin, A. E. & Kopel, S. A. (1975). On resolving ambiguities of the multiple baseline design: Problems and recommendations. Behavior Therapy, 6, 601-608.

Lowe, M. L., & Cuvo, A. J. (1976). Teaching coin summation to the mentally retarded. Journal of Applied Behavior Analysis, 9, 483-489.

Neef, N. A., Iwata, B. A., & Page, T. J. (1978). Public transportation training: In vivo versus classroom instruction. Journal of Applied Behavior Analysis, 11, 331-344.

Trace, M. W., Cuvo, A. J., & Criswell, J. L. (1977). Teaching coin equivalence to the mentally retarded. Journal of Applied Behavior Analysis, 10, 85-92.

Whitehead, C. (1979). Sheltered workshops in the decade ahead: Work and wages, or welfare. In G. T. Bellamy, G. O'Connor, & O. C. Karan (Eds.), Vocational rehabilitation of severely handicapped individuals. Baltimore: University Park Press.

Wilcox, B., & Bellamy, G. T. (1982). Instructional methods. In B. Wilcox and G. T. Bellamy (Eds.). Design of high school programs for severely handicapped students. Baltimore: Paul Brooks Publishing Co.

Table 1

Component Analysis

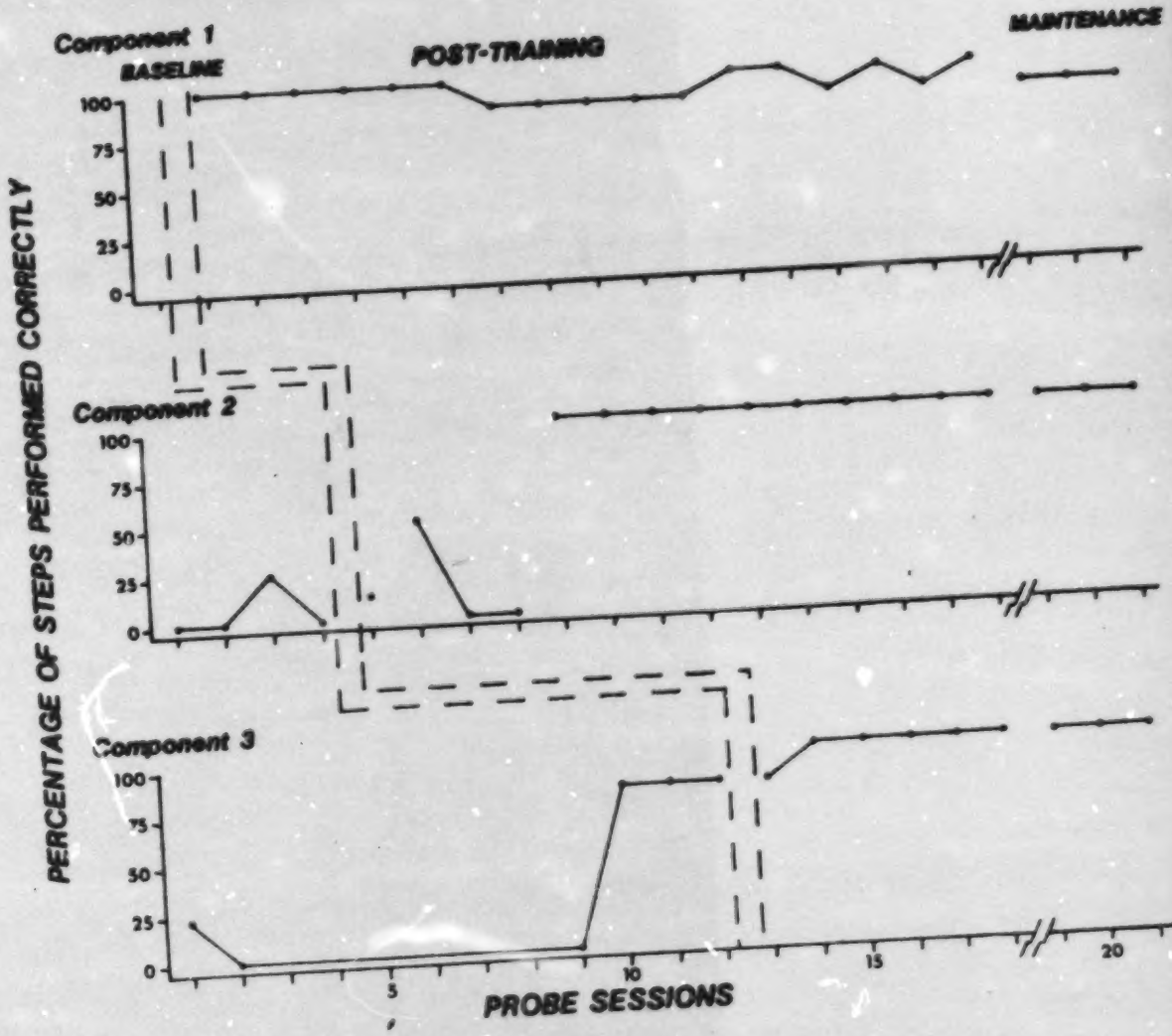
SKILL	USER RESPONSE	VIDEOSCREEN DISPLAY
1.1	Approaches within 2 ft. of machine	WELCOME TO SOVRAN'S ANYTIME BANK
1.2	Removes wallet from pocket and opens it	PLEASE INSERT YOUR CARD FOR SERVICE
1.3	Removes check from wallet, endorses it, and places wallet on counter	
1.4	Removes card from wallet and inserts it into machine, matching "Anytime Bank" on card with "Anytime Bank" on machine	
1.5	Enter personal I.D. number	PLEASE ENTER YOUR PERSONAL IDENTIFICATION NUMBER
1.6	Replace wallet in pocket	ONE MOMENT PLEASE YOUR ENTRY IS BEING PROCESSED
2.1	Push "deposit" button, (#2 decision button)	SELECT TRANSACTION PRESS CANCEL IF ERROR MADE WITHDRAWAL DEPOSIT TRANSFER OTHER
2.2	Push "checking" button, #2 decision button)	SELECT TYPE OF DEPOSIT PRESS CANCEL IF ERROR MADE INTO CHECKING INTO SAVINGS
2.3	Enters check amount by matching check numbers with # buttons on machine in left to right order	ENTER DOLLAR AMOUNT (AMOUNT APPEARS HERE) PRESS IF CORRECT PRESS IF INCORRECT
2.4	Matches check amount shown on screen with amount on check	

SKILL	USER RESPONSE	VIDEOSCREEN DISPLAY
2.5	If screen and check figures correspond, pushes "correct" button (#2)	
2.6	If screen and check figures don't correspond, pushes "incorrect" button (#3) and re-enter check amount (step 2.3)	
		ONE MOMENT PLEASE YOUR TRANSACTION IS BEING PROCESSED
2.7	Lift deposit door and remove deposit envelope.	PLEASE LIFT DOOR AND INSERT ONE SEALED ENVELOPE
2.8	Place check in envelope, seal envelope and place in deposit slot.	
		ITEMS DEPOSITED ARE CREDITED TO YOUR ACCOUNT SUBJECT TO FINAL COLLECTION
3.1	Push "no" button (#3), ending transaction	YOUR TRANSACTION IS COMPLETE WOULD YOU LIKE ANOTHER? PRESS IF YES PRESS IF NO
3.2	Remove wallet from pocket and open it.	PLEASE REMOVE YOUR CARD AND RECEIPT
3.3	Remove receipt from machine, place in money section of wallet.	
3.4	Remove card from machine, place in wallet.	
3.5	Return wallet to pocket.	THANK YOU FOR USING SOVRAN'S ANYTIME BANK
3.6	Walk away from machine	SOVRAN NATIONAL BANK BEING THE BEST IS A LIFETIME JOB

Figure Caption

Figure 1. Depiction of automated banking machine.

Figure 2. Percentage of correct responses on generalization probes during baseline, post-training and maintenance conditions.


Component 1
BASELINE
POST-TRAINING
MAINTENANCE
100
75
50
25
0
Component 2
100
75
50
25
0
Component 3
100
75
50
25
0
5
10
15
20
PERCENTAGE OF STEPS PERFORMED CORRECTLY
PROBE SESSIONS

A DEMONSTRATION OF THE ACCEPTABILITY OF APPLIED BEHAVIOR ANALYSIS IN A NATURAL JOB ENVIRONMENT

Valerie Brooke

Janet W. Hill

Cynthia A. Ponder

Rehabilitation Research and Training Center
School of Education
Virginia Commonwealth University
Richmond, Virginia 23284-0001

Development and dissemination of this paper was supported by grant #G008301124 from the National Institute of Handicapped Research.

Abstract

The present study involves the implementation of a reinforcement point system with a mentally retarded worker to increase appropriate job completion in a natural community job setting--the kitchen of a private hospital. Using a changing criterion design, the study demonstrated the effectiveness of the program. Social validation questionnaires showed the effectiveness of the intervention and the acceptability of such techniques to the employer. Implications of these results for personnel preparation programs and the effects of implementing more elaborate behavioral intervention programs on the attitudes of significant others in the job site are discussed.

A Demonstration of The Acceptability Of
Applied Behavior Analysis In a
Natural Job Environment

Current rehabilitation literature contains an increasing numbers of successful job placement demonstrations with persons who are moderately to severely mentally retarded using direct job site training/advocacy services (Brickey, Browning, & Campbell, 1982; Brickey & Campbell, 1981; Kraus & MacEachron, 1982; Sowers, Thompson & Connis, 1979; Wehman, 1981). These services have been described as the Supported Work Model (Wehman & Kregel, in press). The use of direct job site training in natural work environments raises legitimate concerns regarding the use of more elaborate behavior change intervention than are normally used by regular supervisors on the job. Two primary questions surface regarding the use of applied behavior analysis in the presence of nonhandicapped coworkers on community job sites. The first involves the issue of consumer acceptability: that is, will such techniques be deemed acceptable by employers and coworkers on the job? The second involves threats to the principle of normalization and whether the treatment outcome justifies the risk that the individual may be viewed as more abnormal.

Examining the first issue of consumer acceptability, Menchetti, Rusch, and Lamson (1981) offer some disconcerting evidence that employers, themselves, may not approve of certain common techniques such as token economies, ignoring inappropriate behavior, or the use of golf counters in data collection on the job. The authors, however, caution the reader in the interpretation of these survey data. For instance, although 60 percent of the small sample of employers had indicated a previous working history with handicapped, this did not mean that these employers had ever been involved with a program capable of providing job coaching or direct job site training used with the supported work model (in press). In other words, the employer's opinions may have been very different had

they worked with job placement professionals who have been trained to systematically apply behavioral procedures such as token economies.

Secondly, the use of more elaborate behavioral strategies in natural community settings may indeed pose threats to the principal of normalization. This concern stems from investigations showing that certain treatments may promote an image of an individual as being more severely handicapped than is actually the case (Kazdin, 1980). In line with this finding, Rusch & Menchetti (1981) show that a common technique which is "normally" used in work settings with nonhandicapped can be systematically applied to modify the behavior of a mentally handicapped individual on the job. The technique used was the threat and contingent use of suspension. Although demonstrations such as this are important in that they vividly challenge us to use the most normalizing technique possible in a natural community job site, such findings should not serve to disarm us of the behavioral strategies which are demanded for effective teaching of persons who are more severely handicapped. Intuitively, we know that the threat of suspension would probably not be the technique of choice when working with individuals who are more intellectually limited.

With the growing acceptance of direct job site training as an effective means of assisting the mentally retarded into the work force, careful application and multiple demonstrations are needed to determine empirically which behavioral strategies will be deemed acceptable and useful in natural work settings. The purpose of this paper is to demonstrate the implementation of a reinforcement point system or token economy in a natural job setting and to show not only its acceptability but the employer's reliance on the program and improved view of the client's working ability following the program. Reinforcement economies have been used for many years in clinical settings such as institutions (Ayllon & Azrin, 1968), school settings (Baer & Guess, 1973; Baker, Stanish, & Fraser, 1972) and in

homes or group homes (Bates, 1980; Fixsen, Wolf, & Phillips, 1973). However, there is a paucity of such demonstrations in actual job sites in the community. The objective of the present program was to enable a retarded worker to receive the secondary reinforcement in the form of points delivered by his actual supervisor contingent upon the completion of assigned duties.

Method

Client

Tom is a 25 year old man with a measured IQ of 52 using the Stanford Binet Intelligence Scale. He presents himself well socially with a neatly groomed appearance and some conversational skills, although topic selection is often not age-appropriate. Functionally, Tom cannot read or write. He lives at home with his mother who transports him to and from work. Tom works as a pot scrubber in the kitchen of a private hospital. He had maintained this job successfully for two and a half years after an initial intensive training period when the current problem was brought to the attention of his follow-up job trainer.

Job Setting and Training

The program was conducted in the kitchen of the hospital where Tom was employed. The kitchen prepared food for approximately 850 patients and 400 employees each day. The employer considered this a moderate work load for a pot scrubber. Tom's initial job training involved instruction in the following skills:

use of a time clock
method to clean a pot
system to organize a work area
orientation of the job site
associating time of day with the appropriate break time
operating a garbage disposal
operating an industrial trash compactor
mopping
sweeping
method to clean stainless steel
a variety of socialization skills

The employer and job trainer decided that Tom was performing these duties to preselected criterion after 120 hours of intensive job training. Fading of the job trainer on the job site then occurred.

Social Validation of the Presenting Problem

The supported work program which provides follow-up services to Tom, regularly distributes the Supervisor's Evaluation form, shown in Table 1, to each client's actual supervisor on the job. The supervisor indicates on the form the client's current proficiency on the job and states whether or not the job trainer is needed

- - - - - - - - - - - - - - -
Insert Table 1 About Here
- - - - - - - - - - - - - - -

again for direct services. The evaluation in Table 1 shows that prior to intervention, Tom's performance was threatening his job and that a meeting between the job trainer and supervisor was requested. During the resulting meeting, the supervisor indicated that Tom was routinely (1) not cleaning the certain odd shaped pans, (2) leaving large stacks of dirty sheet pans and (3) leaving work area dirty (i.e. floors greasy, garbage in sink, etc.). The supervisor had noted on his desk calendar that Tom, on the average, completed all of these three work assignments only one day out of five. The supervisor designated these days as "good" days. When any one of the three tasks had not been completed he defined it as a "bad day" and indicated that too on his calendar. Thus, Tom was completing his work appropriately only 20% of the time within a five day time constraint. The employer indicated that he would now accept no more than one "bad day" per month. The job trainer informed the employer that this was a stringent criterion which essentially required appropriate behavior on the average 95 percent of time. The employer, however, insisted that for the three specific work behaviors defined, a 95 percent accuracy rate was needed for proper functioning of the kitchen. In other words, clean pans were needed for the next

shift and dirty, greasy floors were considered dangerous.

Procedures

Program Objective

In that the employer provided a specific criterion for eliminating the threat to Tom's job, the objective of the job program was written to directly satisfy those requirements. The program was designed to increase Tom's production rate and performance on all three specific tasks so that it could be demonstrated that he was completing his assignments an average of 95 percent of the time over increasingly longer time constraints.

A secondary objective of the program was to develop a point reinforcement system which would involve minimal supervisor time but adequate reinforcing properties for Tom who exhibited low motivation after two and one half years of routine kitchen work.

Experimental Design

A changing criterion (Hall, 1971; Hall & Fox, 1977; and Hartmann & Hall, 1976) was used to demonstrate the effect of intervention. This particular design is well suited for a behavior problem which may be threatening dismissal from a job in that it neither withdraws nor temporarily withholds intervention on any critical behavior as a part of the demonstration. To illustrate that intervention does indeed exert control over the behavior, a series of subphases involving specific changing criteria are predetermined to predict improvements in performance. If performance corresponds closely to the change in criterion, after a stable baseline phase, we can assume the intervention is responsible for the change (Kazdin, 1982).

The criterion changes of the current program are listed below:

Baseline

Criterion 1: appropriate work behavior 75% of the time over a four day constraint

Criterion 2: appropriate work behavior 80% of the time over a five day time constraint

Criterion 3: appropriate work behavior 90% of the time over a 10 day time constraint

Criterion 4: appropriate work behavior 95% of the time over a 23 day time constraint

Follow-up Subphase: appropriate work behavior 95% of the time over a 60 day period

Maintenance Phase: average 95% percent accuracy over increased period with zero intervention from supported work staff

Data Collection

In baseline, the employer maintained 21 days of data on Tom's performance with simple plus or minus marks on the calendar in his office. This system was adopted at the suggestion of the follow-up trainer. A plus (+) indicated a "good" day for Tom, meaning he had completed the pot scrubbing of all odd shaped pans, all sheet pans and had left his work area clean. A minus (-) indicated that Tom had not completed one or more of these tasks at the end of his shift. No contingencies were in place to alter Tom's behavior during this period. At the end of that 21 day period, five additional days of data were collected by Tom's regular follow-up job trainer who simply visited at the end of Tom's shift and assessed whether Tom would receive a plus or minus that day. The length of the total baseline was 26 days.

Identical data collection procedures were adopted during intervention phases; however, the follow-up trainer often participated with the employer in the collection of data.

Reliability

During all phases of the program a second observer, usually the follow-up trainer, assessed the reliability ratings on at least one out of every five days and often double observations occurred more frequently. Due to the discrete definition of the behaviors being observed, the supervisor and the follow-up job

trainer maintained 100% agreement through the baseline and intervention phases.

Changing Criterion Intervention

Intervention included differential reinforcement of incompatible behavior or DRI (Osterne, 1969) delivered on a daily basis with point exchange conducted through differential reinforcement of high rate responding (DRH) (Brooks & Snow, 1972) over increasing numbers of successful work days. Both schedules involved reinforcement delivery and exchange of "points" in a point system economy (Fixsen, Wolf & Phillips, 1973).

For daily reinforcement (i.e., delivery of points) Tom had to complete the three specific work assignments which in essence was incompatible to the behavior of leaving unfinished work in the three areas. Thus, the DRI schedule involved delivery of points only for specific completion of the three tasks. At the end of each shift, Tom retrieved a recording sheet from his knapsack, listing the three problem areas and asked his employer to rate whether he should receive a plus or minus point for that day. The employer then delivered appropriate points for Tom's work that day. The changing criterion program for higher rate responding (DRH) required that Tom receive and save increasing numbers of plus points over increasing numbers of work days. Tom was always given some room for error. Thus, to exchange, Tom would be required to have a specific number of good days out of larger total of work days.

Criterion 1: In this subphase, Tom was required to receive three plus points on the recording sheet within a four day work period (i.e., completing work assignments 75% of the time during a four day time constraint). Tom had been informed at the onset of the program that he could exchange the three earned points for a desired reinforcer if he could earn them within a four day period. The reinforcer selected was an eight track tape once owned by the job trainer.

Criterion 2: In this subphase, Tom was required to receive four plus points

in the next five day period (i.e., to show completion of work assignments 80% of the time during the time constraint). If met, Tom again was told he could exchange points for an eight track tape.

Criterion 3: In this subphase, Tom was required to receive nine plus points within a 10 day period (i.e., to show completion of work assignments 90% of the time during time constraint). The same back-up reinforcer was again selected.

Criterion 4: In this subphase, Tom was required to receive 22 plus points within a 23 day period (i.e., to finally show completion of work assignments according to the employer's standards of an average of 95% time). The same back-up reinforcer was again used in the point exchange.

The follow-up criterion was to maintain completion of the three jobs 95% of the time; however, the time constraint for point exchange was lengthened considerably in order to thin the reinforcement schedule. In this phase, Tom was to collect 60 plus points in 63 working days in order to exchange the points for a newly selected reinforcer of friday evening "happy hour" with the follow-up trainer.

A maintenance period was also conducted in which no specific criterion was set but data were collected and maintained by the employer for an additional 60 day period.

Social Validation of Program Effectiveness and Acceptability of Procedures

A post-intervention supervisor evaluation form was collected and is shown in Table 2. The comments validated not only the necessary improvements in Tom's

- - - - - - - - - - - - - - -
Insert Table 1 About Here
- - - - - - - - - - - - - - -

performance, but also the employer's acceptance, reliance and interest in the charging criterion system. Anecdotally, the employer stated that the program gave him many ideas to improve the performance of other (nonretarded) workers.

Results and Discussion

Figure 1 shows a histogram depicting the criterion changes expressed in per-

- - - - - - - - - - - - - - - -
Insert Figure 1 About Here
- - - - - - - - - - - - - - - -

cent of appropriate ("good") work days required on the average over the increasingly longer time constraints. The width of the individual bars show the length of the time constraint and the height of the bars show the percent of appropriate work days required within that time constraint.

Examination of the results shown in Figure 1 clearly illustrate that Tom's performance corresponds very closely to each change in criterion. Therefore, using this experimental design the intervention can be considered to be responsible for the changes. This is further underscored by the fact that in most of the phases Tom reached his criterion before the time constraint was complete. Specifically, he reached Criterion One of three good days out of four in three days. Criterion Two of four good days out of five, however, took five days to reach. Criterion Three of nine good days out of 10 took nine days and Criterion Four of 22 good days out of 23 was met in 22 days. During the follow-up phase 62 days were required to gain 60 points.

The results of the pre- and post- intervention supervisor evaluations surveys clearly validate (1) the need for the program; (2) that appropriate behavior change was accomplished via a point-reinforcement program; and (3) that the program was considered acceptable and beneficial within a natural competitive job environment.

Although the provision of training within complex community environments presents difficult challenges to professionals involved in such activities, the guiding rule must be to select the most normalizing strategy possible. In job placement of historically unemployed persons, however, this rule cannot be interpreted

as a directive to limit the job trainer to only those techniques utilized with non-handicapped employees in jobs. To negate the use of a behavioral technology in natural work settings, gives allegiance to the traditional rehabilitation model which advocates a "sink or swim" approach to job placement. Clearly we know that this approach is unsuccessful with clients who are mentally retarded. Creative problem solving toward normalizing behavioral strategies for the public eye is perhaps the most critical skill needed for professionals involved in the supported work model but it is an area not adequately addressed in personnel preparation programs for most job placement service providers.

Careful examination of the literature shows increasing use of applied behavior analysis to improve vocational skills with developmentally disabled persons. The bulk of this literature, however, involves implementation of procedures in settings approved and designed especially for training purposes. Such training settings are distinct from actual job sites in which the client is competitively employed. Many more demonstrations are needed showing the acceptability or lack of acceptability of applied behavior analysis in natural community job sites with persons who have previously been considerated unemployable.

References

Ayllon, T., & Azrin, N. H. (1968). Reinforcer sampling: A technique for increasing the behavior of mental patients. Journal of Applied Behavior Analysis, 1, 13-20.

Baer, D. M., & Guess, D. (1973). Teaching productive noun suffixes to severely retarded children. American Journal of Mental Deficiency, 77, 498-505.

Baker, J. G., Stanish, B., & Fraser, B. (1972). Comparative effects of a token economy in nursery school. Mental Retardation, 10(4), 16-19.

Bates, P. (1980). The effectiveness of interpersonal social skills training on the social skills acquisition of moderately and mildly retarded adults. Journal of Applied Behavior Analysis, 13, 237-248.

Brickey, M., Browning, L., & Campbell, K. (1982). Vocational histories of sheltered workshop employees placed in Projects With Industry and competitive jobs. Mental Retardation, 20, 52-57.

Brickey, M., & Campbell, L. (1981). Fast food employment for moderately and mildly retarded adults. Mental Retardation, 19, 113-116.

Brooks, J., & Snow, M. (1972). Two case illustrations of the use of behavior modification techniques in the school setting. Behavior Therapy, 3, 100-103.

Fixsen, D. L., Wolf, M. M., & Phillips, E. L. (1973). Achievement Place: A Teaching-Family model of community-based group homes for youths in trouble. In Hammerlynck, et. al. (Eds.), Behavior Modification, Champaign, Illinois: Research Press.

Hall, R. V., & Fox, R. A. (1977). Changing-criterion designs: An alternate applied behavior analysis procedure. In B. C. Etzel, J. M. LeBlanc, and D. M. Baer (Eds.), New developments in behavioral research: Theory, method and application. In honor of Sidney W. Bijou. Hillsdale, N. J.: Lawrence Erlbaum.

Hall, R. V. (1971). Behavior management series: Part II. Basic principles. Lawrence, Kansas: H & H Enterprises.

Hartmann, D. P., & Hall, R. V. (1976). The changing criterion design. Journal of Applied Behavior Analysis, 9, 527-532.

Kazdin, A. E. (1980). Acceptability of alternative treatments for deviant behavior. Journal of Applied Behavior Analysis, 13, 259-273.

Kazdin, A. E. (1982). Single-case research designs. New York: Oxford University Press.

Kraus, M., & MacEachron, A. (1982). Competitive employment training for mentally retarded adults: The supported work model. American Journal of Mental Deficiency, 86, 650-653.

Menchetti, B. M., Rusch, F. R., & Lamson, D.S. (1981). Employers' perceptions of acceptable training procedures for use in competitive employment settings. Journal of the Association for the Severely Handicapped, 6, 6-16.

Osborne, J. G. (1969). Free-time as a reinforcer in the management of classroom behavior. Journal of Applied Behavior Analysis, 2(2), 113-118.

Rusch, F. R. & Menchetti, B. M. (1981). Increasing compliant work behaviors in a non-sheltered work setting. Mental Retardation, 19, 107-112.

Sowers, J., Connis, L., & Thompson, R. (1979). The food services vocational training program. In G. T. Bellamy, G. O'Connor, & O. C. Karan (Eds.), Vocational rehabilitation of severely handicapped persons. Baltimore: University Park Press.

Wehman, P. (1981). Competitive employment: New horizons for severely disabled individuals. Baltimore: Paul Brookes Publishing Co.

Wehman, P., & Kregel, J. (in press). The supported work model: Toward job placement and retention of severely handicapped individuals. Journal of the Association for the Severely Handicapped.

Table 1

SUPERVISOR'S EVALUATION FORM

TRAINEE/EMPLOYEE'S NAME: Tom DATE HIRED: 10-26-87

JOB TITLE: Utility Worker - Pot Scrubber CURRENT DATE: 2-25-88

JOB SITE: Doctors Hospital

Please circle the number that best represents your opinion about the trainee/employee's present situation.

1. The employee arrives and leaves on time.

1	2	3	4	(5)
Much Too Seldom	Not Often Enough	Undecided	Usually	Always

2. The employee maintains good attendance.

1	2	3	4	(5)
Much Too Seldom	Not Often Enough	Undecided	Usually	Always

3. The employee takes meals and breaks appropriately.

1	2	3	4	(5)
Much Too Seldom	Not Often Enough	Undecided	Usually	Always

4. The employee maintains good appearance.

1	2	3	4	(5)
Much Too Seldom	Not Often Enough	Undecided	Usually	Always

5. The employee's performance compares favorably with the other workers' performance.

1	(2)	3	4	5
Strongly Disagree	Somewhat Disagree	Undecided	Somewhat Agree	Strongly Agree

6. Communication with the employee is not a problem.

1	2	(3)	4	5
Strongly Disagree	Somewhat Disagree	Undecided	Somewhat Agree	Strongly Agree

7. The employee attends to job tasks consistently.

1	(2)	3	4	5
Strongly Disagree	Somewhat Disagree	Undecided	Somewhat Agree	Strongly Agree

8. Your overall appraisal of the employee's proficiency at this time.

1	(2)	3	4	5
Needs Immediate Improvement	Somewhat Sub-standard	Satisfactory	Somewhat Better Than Required	Much Better Than Required

9. Do you wish to meet with a representative from the Project staff?

(YES) NO

Additional Comments: Tom's performance is not consistent from day to day. The slightest distraction (someone talking, a special function, etc.) causes Tom to fall behind in his work. Some days, he does not even speak at all; and it is difficult to communicate with him. Only completes his work one day out of five.

BEST COPY AVAILABLE

SUPERVISOR'S EVALUATION FORM

TRAINEE/EMPLOYEE'S NAME: Tom DATE HIRED: 10-16-81

JOB TITLE: Pot Scrubber CURRENT DATE: 6-22-83

JOB SITE: Doctors Hospital

Please circle the number that best represents your opinion about the trainee/employee's present situation.

1. The employee arrives and leaves on time.

1	2	3	4	(5)
Much Too Seldom	Not Often Enough	Undecided	Usually	Always

2. The employee maintains good attendance.

1	2	3	4	(5)
Much Too Seldom	Not Often Enough	Undecided	Usually	Always

3. The employee takes meals and breaks appropriately.

1	2	3	4	(5)
Much Too Seldom	Not Often Enough	Undecided	Usually	Always

4. The employee maintains good appearance.

1	2	3	4	(5)
Much Too Seldom	Not Often Enough	Undecided	Usually	Always

5. The employee's performance compares favorably with the other workers' performance.

1	2	3	(4)	5
Strongly Disagree	Somewhat Disagree	Undecided	Somewhat Agree	Strongly Agree

6. Communication with the employee is not a problem.

1	2	(3)	4	5
Strongly Disagree	Somewhat Disagree	Undecided	Somewhat Agree	Strongly Agree

7. The employee attends to job tasks consistently.

1	2	3	(4)	5
Strongly Disagree	Somewhat Disagree	Undecided	Somewhat Agree	Strongly Agree

8. Your overall appraisal of the employee's proficiency at this time.

1	2	(3)	4	5
Needs Immediate Improvement	Somewhat Sub-standard	Satisfactory	Somewhat Better Than Required	Much Better Than Required

9. Do you wish to meet with a representative from the Project staff?

YES (NO)

Additional Comments: Recently, Ms. Brooke instituted a program where Tom is given a daily mark according to how well he did that particular day. At the end of a predetermined period, if Tom does well, he receives a reward. I found this very helpful in that Tom has become more consistent in his work. If he has a bad day, we discuss the problem and try to arrive at some solution. Tom seems to enjoy the program and takes pride in his daily progress. I greatly appreciate Ms. Brooke's help in this matter.

BEST COPY AVAILABLE

Figure Caption

Figure 1. Percent of appropriate work days within time constraints for Tom.

BASELINE
CHANGING CRITERION INTERVENTION
PERCENT OF APPROPRIATE WORK DAYS WITHIN TIME CONSTRAINT
Criterion 1
Criterion 2
Criterion 3
Criterion 4
Follow-up Phase
WORK DAYS

THE DEVELOPMENT OF PUNCTUALITY IN A MENTALLY RETARDED WORKER THROUGH SELF-RECORDING

Michael S. Shafer Valerie Brooke

Rehabilitation Research and Training Center
School of Education
Virginia Commonwealth University
Richmond, Va. 23284-0001

The development and dissemination of this paper was supported by grant No. 08301124 from the National Institute of Handicapped Research.

Abstract

The present study evaluated the effects of self-recording on the frequency and duration of early check-outs from work by a severely disabled, mentally retarded worker. The results of an A-B-A-B reversal analysis indicated that self-recording dramatically reduced both the frequency and duration of early check-outs, thereby facilitating the continued employment of the client. Variables which may account for the effect of self-recording and implications of these findings for the job placement of mentally retarded persons are discussed.

The Development of Punctuality in a Mentally Retarded Worker Through Self-Recording

A frequently cited factor in the dismissal of handicapped workers is inadequate attendance and excessive tardiness (Greenspan & Schoultz, 1981; Kochany & Keller, 1981; Pudrud, Ferrara, & Ziarnik, 1980; Sowers, Rusch, Connis, & Cummings, 1980). With mentally retarded workers, several factors may contribute to this problem, including relying upon others for transportation, failing to understand the contingencies of work, and failing to understand time concepts. Although acquisition of time-telling skills is not critical for obtaining and maintaining competitive employment, an awareness of the importance of punctuality in arriving and leaving work is essential to insuring long-term, successful employment among mentally retarded persons.

One strategy that has been employed to develop punctuality among non-time-telling mentally retarded workers has been the use of cue cards with clock faces printed on them (Sowers et al., 1980; Vogelsberg & Rusch, 1980). Sowers et al. (1980), for example, used cue cards in combination with pre-instructions and instructional feedback to teach three retarded workers when to begin and end lunch and coffee breaks. Within a multiple baseline design, each subject was taught to begin and end his/her break when the time shown on the cue card matched that shown on a real clock. Dramatic improvements in the punctuality of each subject was demonstrated and shown to maintain after pre-instructions and instructional feedback had been withdrawn. The use of such cue cards, however, appear limited in application to employment situations in which schedule variations are minimized. For example, a worker who is required to perform an additional task before his lunch break would inadvertently experience a shorter lunch period if he attended solely to the cue cards.

An alternative strategy that could be employed with mentally retarded workers

is the use of self-recording procedures. The effectiveness of self-management techniques as a behavior change agent has previously been demonstrated with nonhandicapped children (Liebert, Spiegler, & Hall, 1970; Thomas, 1976), and with adults in clinical settings for the amelioration of obesity (Mahoney, Moura, & Wade, 1973), smoking (Axelrod, Hall, Weis, & Rohrer, 1974), and substance abuse (Sobell & Sobell, 1972). Recent demonstrations have also extended the effectiveness of self-management techniques to mentally retarded persons for increasing work productivity (Jens & Shores 1969; Wehman, Schutz, Bates, Renzaglia, & Karan, 1978; Zohn & Bornstein, 1980), task sequencing (Connis, 1979) and study behavior (Horner & Brigham, 1979). Collectively, these studies indicate that mentally retarded adults are capable of self-monitoring their own behavior with a great deal of accuracy.

A desirable phenomenon reported in self-recording investigations has been the occurrence of reactive alterations in the target behavior (Herbert & Baer, 1972; Nelson, Lipinski, & Black, 1972). While a variety of theories have been posited to account for reactivity, the critical issue for the clinician is that self-recording may provide a relatively unobtrusive and feasible means of producing generalized behavior change. As applied to the development of time-management skills with a mentally retarded worker, requiring the worker to record arrival and departure times may facilitate improved punctuality. The purpose of the present study, therefore, was to assess the applicability of self-recording procedures to improve the punctuality of a mentally retarded worker. Within this context, a reversal design was employed, in which self-recording and intermittent staff feedback were systematically applied and then withdrawn.

Method

Client and Setting

A 31 year-old severely disabled, mildly retarded woman, employed as a silverware roller at a supper club participated in this study. Shari had obtained her job

through the services of a federally funded vocational rehabilitation project providing placement, training, and follow-up services for mildly to severely retarded adults (Wehman & Kregel, in press). Prior to her placement at the supper club, Shari had attended a prevocational training program. She worked approximately 25 hours per week, Monday through Friday, with another mentally retarded worker. Shari and her coworker shared the same job duties and schedule.

Dependent Measure

Each workday, the restaurant manager told Shari and her coworker the time they were to check-out. The check-out time varied from day to day, based upon restaurant projections for that evening's business volume. The dependent measure, therefore, was the number of minutes that the client checked out earlier than her coworker. The restaurant manager had contacted the job trainer due to frequent and inappropriately early check-outs by Shari, who would either leave work unexcused, or provide a somatic excuse for leaving early (e.g., feeling ill).

Data were collected by the authors who reviewed time cards for Shari and her coworker. These time cards displayed initial check-in time, time out and in for lunch, and check-out time at the end of the day. The dependent measure was derived by subtracting Shari's check-out time from that of her coworker.

Procedures

Baseline. During this condition, no contingencies for checking out early were in effect. Shari was required to record her time in and out of work by inserting her time card into the clock. Periodic and unannounced visits by the job trainer were made every three or four days to ensure that Shari and coworker were maintaining appropriate production levels. This condition was in effect for 40 days.

Self-Recording. On the first day of this condition, the job trainer presented Shari with a self recording sheet and instructed her to record her check-out time daily, in addition to checking-out on her time card. The self-recording sheet

consisted of a 8 1/2 by 11 in. piece of paper printed with a calendar grid. The days of the week were printed at the top of the columns, with the dates printed in the upper right hand corner of each box. After presenting the self-recording sheet to the client and explaining the self-recording procedure, the job trainer instructed the client to keep the sheet in her purse. The job trainer provided feedback to the client every three or four days at the job site. During these unannounced visits, the trainer reviewed Shari's self-recording sheet and validated it against her time card. Correspondence between the self-record sheet and time card was reinforced with social praise (e.g., "I'm glad to see you are checking out on time."). Shari was reprimanded if the self-record sheet and time card did not correspond, or if an early checkout had occurred, as it did on day 42. Self-recording procedures were in effect for twelve days.

Baseline II. On the first day of this condition, the trainer informed Shari that she did not need to self-record any more. During this twenty-two day period, conditions were identical to those during the initial baseline phase.

Self-Recording II. Self-recording procedures, identical to those previously described, were reimplemented for 19 additional days. Following days 56, 57, and 60, discrepancies between the self-record and time cards were noted. On these occasions, the job trainer admonished Shari for not recording accurately and emphasized the importance of honesty in keeping a job.

Experimental design. This study employed an A-B-A-B reversal design (Baer, Wolf, & Risley, 1968) to assess the effectiveness of self-recording on the reduction of early check-outs. This design demonstrates experimental control as measures of the dependent variable vary in correspondence with systematic applications and withdrawals of the independent variable. Initial baseline conditions were in effect for 40 days followed by 12 days of self-recording. Subsequently, self-recording procedures were withdrawn, constituting a return to baseline for 22 days, followed by

reimplementation of self-recording for 19 additional days.

Results.

Figure 1 presents the daily deviation, in minutes, of the client's check-out time from that of her coworker. The number of minutes the client checked-out early are plotted along the ordinate with work days plotted along the abscissa.

- - - - - - - - - - - - - - - -
Insert Figure 1 about here
- - - - - - - - - - - - - - - -

During the initial baseline condition, 11 early check-outs were recorded (mean daily occurrence = .28), ranging from 1 minute to 59 minutes (mean = 24.7) in length. Following the implementation of self-recording on day 41, only one early check-out occurred (mean daily occurrence = .08). This check-out was 2 hours, 7 minutes earlier than the coworker's check out time. When self-recording procedures were withdrawn on day 53, 10 early check-outs were recorded (mean daily occurrence = .45), ranging in length from 1 minute to 2 hours, 19 minutes (mean = 36.9 minutes). Following day 76, when self-recording procedures were reimplemented, four early check-outs occurred (mean daily occurrence = .05), ranging from 1 minute to 2 hours, 43 minutes (mean = 41.5 minutes).

Accuracy of self-recording was assessed by comparing self-recorded check-out times with actual check-out times as found on corresponding time cards. Due to Shari's poor time-telling skills, agreements were scored any time differences between self-recorded and actual check-out times were less than 15 minutes. During Self-Recording I, Shari accurately recorded her check-out time 100% of the time. Accuracy during Self-Recording II was 83 percent, as Shari's record corresponded with her time card 15 out of 18 times.

Discussion

The purpose of the present investigation was to assess the effectiveness of self-recording procedures to improve the punctuality of a mentally retarded worker.

Although limited to one client, these results add to the growing body of literature attesting to the employability of mentally retarded persons in competitive non-sheltered sites (cf., Sowers et al., 1980) through the supported work model of job placement and follow-up. Additionally, the application of self-recording with a mentally retarded worker in this study represents a further extension of self management procedures which have typically been restricted to children and adults of normal intelligence.

The rapid reduction in early check-outs obtained during both intervention phases attests to the powerful effects of self-recording. This effect, however, is not clearly demonstrable as periodic trainer feedback was also provided. As such, the results obtained may have been a function of the discriminative properties of self-recording, the contingent feedback by the job trainer, or a combination of the two. Previous investigations have demonstrated the reactive effect that self-recording may produce (cf., Herbert & Baer, 1972). That is, the act of self-recording results in the observed stimulus situation being altered. For example, by engaging in some form of self-recording, the subject is functionally incapable of engaging in an alternative response (e.g., target behavior) resulting in an alteration of the observed situation. An alternative explanation for the reactive effect of self-recording was posited by Rachlin (1976), who suggests that the act of self-recording produces a number of cues, signaling to the subject the external consequences for the observed behavior. As applied to the present investigation, this analysis would suggest that Shari stopped checking out early during self-recording because, in the process of self-recording, the client was reminded of the effect which her check-out time would have on future interactions with the job trainer. Such an analysis may account for the present results since initially during both self-recording phases the client checked out early once and was later reprimanded by the job trainer. Subsequently, however, no further early check-outs were

reported.

The present results are somewhat perplexing when one considers the fact that during baseline, the client was already engaged in a form of self-recording by using the time clock. The time clock, however, employed a one-hundred unit hour system which made translation to a standard sixty minute hour difficult. In addition, the client was not required to attend to the time as the clock automatically printed the time on her time card. In contrast, during self-recording, the client was required to look at the face on the front of the time clock and accurately produce the time on her self-recording sheet. As such, it appears that the act of self-recording may have increased the saliency of time for the client, making her more aware when she checked out early.

Future research should be conducted to further assess the effectiveness of self-recording among mentally retarded persons. The present results add to the existing support for such an application while demonstrating unobtrusive and effective programming as a follow-up strategy for the competitively employed mentally retarded worker.

References

Axelrod, S., Hall, R. V., Weis, L., & Rohrer, S. (1974). Use of self-imposed contingencies to reduce the frequency of smoking behavior. In M. J. Mahoney and C. E. Thoresen (Eds.), Self-Control: Power to the person. Monterey, California: Brooks-Cole.

Baer, D. M., Wolf, M. M. & Risely, T. R. (1968). Some current dimensions of applied behavior analysis. Journal of Applied Behavior Analysis, 1, 91-97.

Bandura, A., & Perloff, B. (1967). Relative efficacy of self-monitored and externally imposed reinforcement systems. Journal of Personality and Social Psychology, 7, 111-116.

Greenspan, S. & Shoultz, B. (1981). Why mentally retarded adults lose their jobs: Social competence as a factor in work adjustment. Applied Research in Mental Retardation, 2, 23-38.

Helland, C. D., Patuck, R. J., & Klein, M. (1976). A comparison of self- and external reinforcement. Mental Retardation, 14(5), 22-23.

Herbert, E. W. & Baer, D. M. (1972). Training parents as behavior modifiers: Self-recording of contingent attention. Journal of Applied Behavior Analysis, 5, 139-149.

Horner, R. H. & Brigham, T. A. (1979). The effects of self-management procedures on the study behavior of two retarded children. Education and Treatment of the Mentally Retarded, 14(1), 18-24.

Jens, K. & Shores, R. (1969). Behavioral graphs as reinforcers for work behaviors of mentally retarded adults. Education and Training of the Mentally Retarded, 4, 21-27.

Kazdin, A. F. (1971). Toward a client administered token reinforcement program. Education and Training of the Mentally Retarded, 6, 52-55.

Kurtz, P. & Newsworth, J. (1976). Self-control possibilities for exceptional children. Exceptional Children, 42, 212-217.

Kochany, L., & Keller, J. (1981). An analysis and evaluation of the failures of severely disabled individuals in competitive employment. In P. Wehman (Ed.), Competitive employment. Baltimore, Md: Paul Brookes Co.

Liebert, R. M., Spiegler, M. D., & Hall, W. M. (1970). Effects of the value of contingent self-administered and noncontingent externally imposed reward on children's behavioral productivity. Psychonomic Science, 18, 245-246.

Mahoney, M. J., Moura, N. G. M., & Wade, T. C. (1973). The relative efficacy of self-reward, self-punishment, and self-monitoring techniques for weight loss. Journal of Consulting and Clinical Psychology, 40, 404-407.

Nelson, R. O., Lipinski, D. P., & Black, J. L. (1976). The reactivity of adult retardates' self-monitoring: A comparison among behaviors of different valences, and a comparison with token reinforcement. The Psychological Record, 26, 189-201.

Pachlin, F. (1976). Introduction to modern behaviorism, (pp 206-218). San Francisco: W. H. Freeman and Company.

Rudrud, E., Ferrara, J., & Ziarnik, J. (1980). Living placement and absenteeism in community-based training programs. American Journal of Mental Deficiency, 84, 401-404.

Sobell, M. B., & Sobell, L. C. (1972). A self-feedback technique to monitor drinking behavior in alcoholics. Behavior Research and Therapy, 1', 237-238.

Sowers, J., Rusch, F. R., Connis, R. T., & Cummings, L. E. (1980). Teaching mentally retarded adults to time manage in a vocational setting. Journal of Applied Behavior Analysis, 13, 119-128.

Thomas, J. D. (1976). Accuracy of self-assessment of on-task behavior by elementary school children. Journal of Applied Behavior Analysis, 9, 209-210.

Vogelsberg, R. T., & Rusch, F. R. (1980). Community mobility training. In F. R. Rusch & D. E. Mithaug (Eds.), Vocational training for mentally retarded adults (pp. 119-145). Champaign, Illinois: Research Press.

Wehman, P. (1975). Behavioral self-control with the mentally retarded. Journal of Applied Rehabilitation Counseling, 6, 27-34.

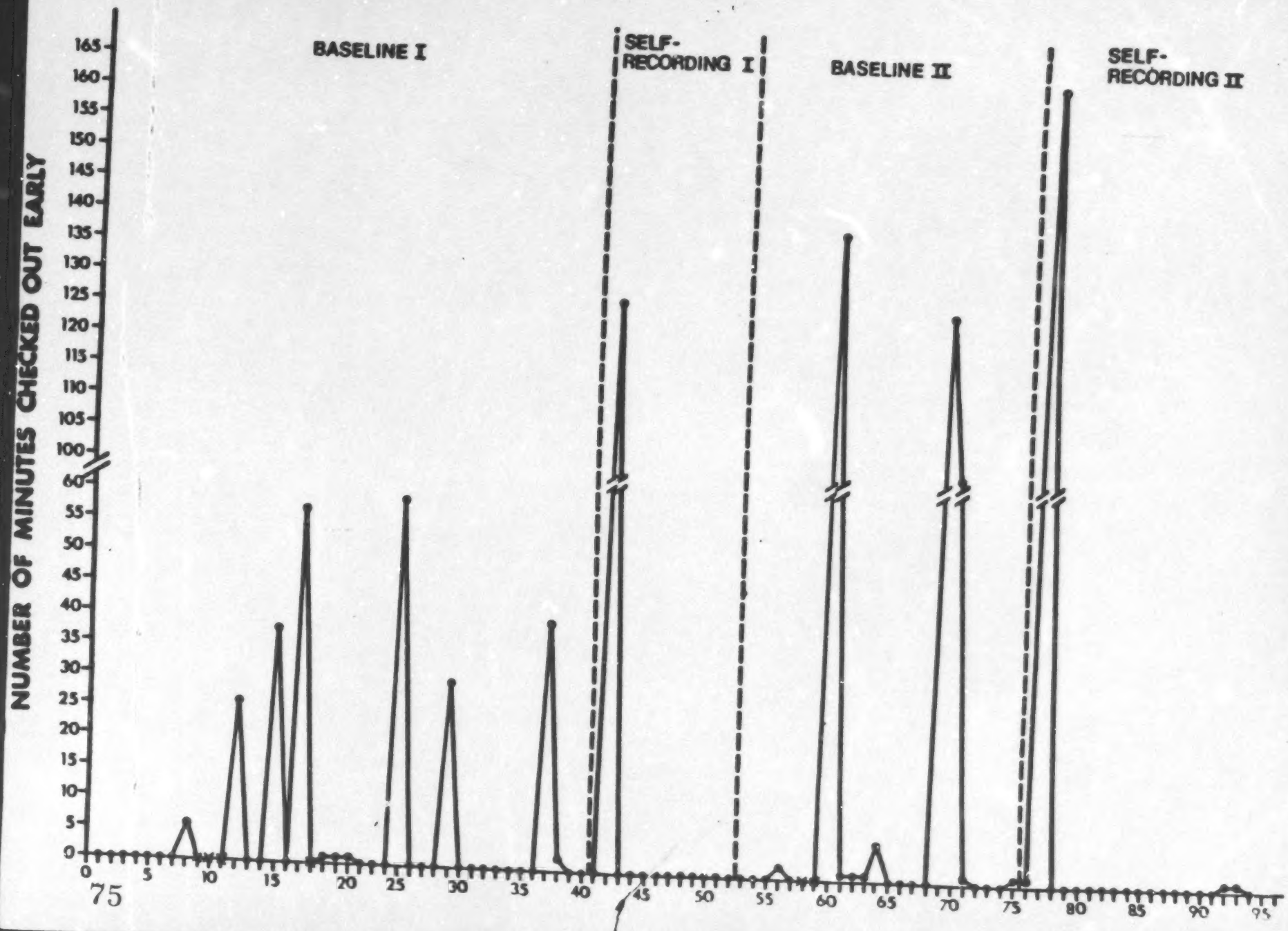
Wehman, P., & Kregel, J. (in press). The supported work model: Toward job placement and retention of severely handicapped workers. Journal of the Association for Severely Handicapped.

Wehman, P., Schutz, R., Bates, P., Renzaglia, A., & Karan, O. (1978). Self-management programs with mentally retarded workers: Implications for developing independent vocational behavior . British Journal of Social and Clinical Psychology, 17, 57-64.

Zohn, C. J. & Bornstein, P. H. (1980). Self-monitoring of work performance with mentally retarded adults: Effects upon work productivity, work quality, and on-task behavior. Mental Retardation, 18, 19-35.

Figure Caption

Figure 1. The number of minutes Shari checked out earlier than her coworker.


BASELINE I
SELF-RECORDING I
BASELINE II
SELF-RECORDING II
NUMBER OF MINUTES CHECKED OUT EARLY
165
160
155
150
145
140
135
130
125
120
115
110
105
100
60
55
50
45
40
35
30
25
20
15
10
5
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95